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Ms. Karen Cibulskis
Remedial Project Manager
United States Environmental Protection Agency
Region V
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, IL 60604

Dear Ms. Cibulskis:

Re: Results of the Bathymetry Survey and Geophysical Investigation
South Dayton Dump and Landfill Site Moraine, Ohio (Site)

This letter report summarizes the South Dayton Dump and Landfill Potentially Responsible Party Group's (PRP Group's) approach and results for the Bathymetry Survey and Geophysical Investigation (Geophysical Investigation) at the Site. Conestoga-Rovers & Associates (CRA) has prepared this letter report on behalf of the Potentially Responsible Party (PRP) Group.

The Geophysical Investigation was completed in accordance with the Land Survey, Bathymetry Survey, and Geophysical Investigation Letter Work Plan (Letter Work Plan) dated May 9, 2008, the final draft of which was conditionally approved by the United States Environmental Protection Agency (USEPA) on May 6, 2008 pending final changes which were completed on May 9, 2008. The Geophysical Investigation was also completed in accordance with the relevant portions of the draft Field Sampling Plan (FSP). The Bathymetry Survey portions of the FSP were approved by USEPA in a telephone call on May 6, 2008. USEPA approved the portions of the FSP related to the Geophysical Investigation in an electronic mail message dated May 31, 2008 pending final changes, which were made on July 4, 2008 (EM31 and EM61 electromagnetic (EM) survey instruments) and July 30, 2008 (all remaining changes). USEPA provided additional comments on August 5, 2008 to which the PRP Group provided responses on August 8, 2008. CRA made final revisions to the geophysical portions of the FSP to incorporate USEPA's comments on August 8, 2008. A revised version of the FSP was submitted to USEPA on August 18, 2008.

The objectives of the Bathymetry Survey were as follows:

- generate topographical information for the bottom of the Quarry Pond; and
- generate information for use in future investigations and remedial alternative evaluations.

The objectives of the Geophysical Investigation were as follows:

- identify buried metals and objects at the Site at surveyed locations; and
- identify areas which may require additional investigation.

The Bathymetry Survey of the Quarry Pond was completed on May 21 and 22, 2008. CRA used a staff gauge located in the Quarry Pond to assess the degree of fluctuations in the water elevations, if any, which may have existed during the course of the survey, and to allow for corrections to the data. CRA provided a draft Bathymetry Survey Report to USEPA on August 15, 2008.

The Geophysical Investigation (on land) was completed by CRA personnel on the following dates: August 13 to 15, 19 to 21, and 26 to 28; September 4, 9 to 11, and 23 to 29; October 7 to 9, and 28 to 30; November 3 to 5; and December 2 to 9, 2008. CRA presented the an update of the results of the Geophysical Investigation to that point to USEPA during a meeting between the PRP Group and USEPA on October 7, 2008.

Prior to commencement of the Geophysical Investigation, extensive brush clearing activities were completed at the former landfill (central portion of the Site) to provide adequate and safe access for the geophysical operators and their instrumentation. An excavator equipped with a large cutting head was utilized to clear the brush. Brush clearing activities were performed between June 23 and August 11, 2008. During and after completion of brush clearing activities, CRA consolidated on-surface metal objects. In addition, waste pallets were removed from the former Busy Bee pallet recycling operation, which was located on the central portion of the Site. The pallets were removed in August 2008 by a contractor retained directly by the Site owner. Removal of the pallets was required to permit geophysical surveying in this area and to remove materials remaining following Busy Bee's departure from the Site that might pose a health and safety or environmental risk, were they left in place. In an effort to minimize the degree of disruption to active business operations along Dryden Road and East River Road, CRA attempted to work with the individual landowners with respect to clearing proposed survey areas of heavy equipment, salvaged vehicles, miscellaneous surficial metal debris, etc. The overall schedule for the geophysics was delayed considerably in order to accommodate the landowners' schedules with respect to clearing proposed survey areas of heavy equipment, salvaged vehicles, and miscellaneous surficial metal debris. A few areas could not be surveyed as material could not be moved or the presence of buildings, power lines, or other cultural interferences prevented use of the survey equipment.

REFERENCE GRID

Prior to commencement of the Bathymetry Survey and Geophysical Investigation, a grid of parallel lines was established over accessible areas of investigation. The grid utilized a number

of control points that were established at 150-foot intervals in the north-south direction, and 160-foot intervals in the east-west direction using a global positioning system (GPS) receiver. The geophysical survey lines were initially spaced at 40-foot intervals as specified in the Letter Work Plan. However, initial results of the Geophysical Investigation indicated that a significant portion of the area of investigation, the central portion of the Site in particular, registered as anomalous on the geophysical equipment due to the presence of significant quantities of metallic debris, slag, foundry sands, and other reflective or conductive material. Thus, in accordance with the Letter Work Plan, 20-foot spaced survey lines were established and this survey line spacing was adopted for all geophysical land survey areas, essentially doubling the initial proposed survey coverage. In addition to these survey lines, perpendicular survey lines were also established at 150-foot intervals along the lines joining the control points. All survey lines were labeled with Cartesian coordinates, to facilitate use of the instrument data loggers. A Site Plan showing the survey coverage and control point locations is provided on Figure 1. The grid on Figure 1 was shifted slightly from the grid presented in the May 9, 2008 Letter Work Plan in order to maximize the coverage of the Site. CRA provided USEPA with the revised grid via electronic mail on August 25, 2008.

BATHYMETRY SURVEY INSTRUMENTATION AND METHODOLOGY

As previously indicated, the Bathymetry Survey was completed on May 21 and 22, 2008. CRA personnel and Ken McMillan of McQuest Marine Sciences Limited (McQuest) completed the Bathymetry Survey using an ODOM Hydrotrac Echosounder which consists of a transducer and recorder/transceiver of the acoustic information. The transducer generated a sound pulse that was directed through the water column and the recorder/transceiver recorded the signal that bounced back from the bottom of the water body. The time interval between initiation of the sound pulse and receipt of the reflected signal from the bottom of the water body was used to calculate the height of the water column. A Trimble GPS DSM 132 antenna was mounted above the transducer and securely attached to the side of the boat. Mounting the GPS above the transducer allowed for the simultaneous collection of depth data and positioning information. The GPS was configured to use differential GPS (DGPS) using Omni Star corrections for sub-meter positioning. Prior to collecting data, the ODOM Hydrotrac Echosounder was calibrated for the average speed of the sound of water (m/s) using a Valeport soundbar 2-digital bar check.

The survey lines were pre-programmed into the navigational component of the Trimble Hydropro software, in Universal Transverse Mercator (UTM) coordinates. The GPS data from the Trimble GPS DSM 132 was streamed through the software providing the boat operator with the current position in UTM coordinates via a computer, in relation to the position of the pre-programmed survey line. This allowed the boat operator to maintain control of the position of the boat along the programmed survey lines.

The water depth data and GPS point locations were stored in digital format using the Trimble Hydropro Software. Data were also recorded simultaneously in an analog strip chart for use in verifying digital depth sounding results using the ODOM Hydrotrac Echosounder.

As previously indicated, a staff gauge was placed in the Quarry Pond to monitor the rise and fall, if any, of the surface water elevation over the duration of the survey. The staff gauge was GPS surveyed for reference in Ohio State Plane coordinates and in Decimal Degrees, 1983 North American Datum (NAD 83)/1988 North American Vertical Datum (NAVD 88). Measurements were recorded from the top of the staff gauge to the water surface. For each day of the Bathymetry Survey, measurements were taken at the beginning of the day prior to any data collection, periodically throughout the day, and upon completion of each day, such that the data could be corrected for any water level fluctuations that may have occurred. These measurements verified that the water level in the Quarry Pond did not fluctuate over the course of the survey. GPS and water column depth data are provided on the compact disk found in Attachment A. The surface water elevation data are summarized and also provided on the compact disk found in Attachment A.

BATHYMETRIC DATA PROCESSING AND RESULTS

The data were processed as a colored contour plot, which was superimposed on a 2005 aerial photo of the Site outlining the surveyed area as shown on Figure 2. The Bathymetry Survey results show that the Quarry Pond is divided by a long, north-south trending shallow ridge that extends through the island located on the east side of the Quarry Pond. The deepest areas occur in the western half of the Quarry Pond, where water depths in the range of 20 feet to 30 feet were observed. The northwest portion of the Quarry Pond was deeper than 35 feet. One shallow "pillar" was also delineated in the western half of the Quarry Pond. The “pillar” structure extends west of the northern tip of the island, and was characterized as having shallow water depths of approximately 5 feet.

The Bathymetry Survey data show that a large ridge is located to the north and south of the island. South of the island the ridge is approximately 120 feet wide and extends to within 50 feet of the southern shore of the Quarry Pond. The ridge pinches out slightly to 80 feet wide north of the island. Relatively shallow water depths, generally on the order of 5 to 15 feet, were present over the ridge. To the east of this feature, the water depth increased to between 15 and 23 feet along a thin wedge, adjacent to the eastern shoreline of the Pond. The eastern portion of the Pond also has one small bay to the east and a second larger bay to the southeast. The small bay to the east was shallow, with depths ranging from 2.5 to 7.5 feet, whereas the larger bay to the southeast was deeper, with depths of 15 to 20 feet. Due to the number of fallen trees and the amount of brush (submerged and partially submerged) which were observed in the bays, the survey was limited to those areas that could be accessed with the survey boat.

Along the entire shoreline of the Quarry Pond, the minimum water depth that could be measured was approximately 2.5 feet. The steep drop off along the shoreline and position of the Echosounder transducer in the water column were some of the limiting factors in determining depths along the Pond edges. In addition, submerged tree stumps and logs also interfered with the progress of the Bathymetry Survey in certain areas of the Pond. As indicated on Figure 2, all water depths measured were relative to a water level datum of 711.37 feet above mean sea level measured on May 21 and 22, 2008.

GEOPHYSICAL INSTRUMENTATION AND METHODOLOGY

As previously indicated, the land portion of the Geophysical Investigation were completed on 20-foot spaced lines between August 13 and December 9, 2008, over accessible areas of the Main Site and surrounding businesses. The geophysical investigation used magnetic and EM, techniques to identify both ferrous and non-ferrous buried metal objects at surveyed locations to depths of up 20 feet below ground surface (ft bgs).

The Letter Work Plan also included the use of ground penetrating radar (GPR). However, the use of GPR was deemed infeasible due to the following physical factors present at the Site:

- the presence of surficial metallic debris throughout much of the Site;
- the presence of slag and fly ash at the ground surface and upper surficial soil inventory (0 to 3 feet below ground surface interval) that would be reflective to the GPR and interfere with (or eliminate) the ability of the equipment to obtain meaningful data; and
- the presence of reinforced concrete debris through large portions of the Site, which would also interfere with the GPR survey.

The PRP Group and USEPA discussed the elimination of the GPR survey from the scope of the geophysical investigation during a conference call on September 2, 2008. USEPA provided their approval of the proposed change during the September 2, 2008 conference call and CRA documented the change in a letter from CRA to USEPA dated September 9, 2008.

The geophysical methods are briefly described below.

EM61 Buried Metal Detector

The EM61 is a time-domain buried metal detector, which detects both ferrous and non-ferrous metals with excellent spatial resolution. The EM61 has an effective depth of investigation of approximately 10 ft bgs, and operates at a frequency of 150Hz. The EM61 uses two 1.5- by 3-foot rectangular coils in a stacked configuration (one foot apart) which are mounted to a wheeled cart, to transmit 150 EM pulses per second into the ground at each measuring point.

During the off-time between transmitted pulses, receiver coils measure the decay of the transient electrical currents induced by the pulses. Electrical currents in moderately conductive earth materials (including moist clays, mineralized soils, etc.) dissipate rapidly, leaving only the more prolonged currents due to buried metal objects. The EM61 detects and measures these prolonged transient currents, yielding a result in milliVolts (mV) proportional to the metallic content of the buried object, and inversely proportional to its depth of burial. The EM61 exhibits good lateral (or horizontal) resolution of buried metal objects (in the presence of one object or several objects situated in close proximity) in comparison to other EM methods, due to its stacked coil configuration.

For this investigation, the EM61 was nulled in a background location outside of the suspected landfilling footprint. Specifically, the location was 50 feet west of monitoring well MW103, in the floodplain of the Great Miami River adjacent to the Site. All EM61 data were collected on 20-foot spaced survey lines in the north-south direction and 150-foot spaced lines in the east-west direction along the survey lines by automatically triggering a reading at 0.677-foot stations, with data points recorded using a Juniper Systems Pro4000 data logger. During the course of the EM61 survey, the presence of surficial metallic objects and other potential sources of interference were noted in a field book and identified on the survey results. Upon returning from the Site, all data were downloaded to a computer and compiled for data processing and interpretation.

Due to accessibility limitations associated with the EM61 instrument, survey coverage consisted of open accessible areas of the Site. Inaccessible areas which could not be surveyed included ponds/marsh areas, wooded areas, ravines, asphalt and gravel piles, and areas where truck trailers, heavy equipment, salvaged vehicles and miscellaneous metal debris were located.

Magnetometer Survey

The magnetometer surveys were completed using a GEM GSM-19 Overhauser Magnetometer Both total field and magnetic gradient readings were measured at 0.5-second intervals, and all data were stored in the instrument's internal memory. The magnetic survey consisted of both total field and vertical gradient data collection. In order to determine the amount of diurnal variation or magnetic drift, (if any), during the course of the survey, readings were recorded at a base station location. The base station location was the same as was used for the EM61 nulling location, namely 50 feet west of monitoring well MW103 in the floodplain. Review of these data reveals that the magnetic drift was negligible for a majority of the survey [10 to 15 nanoTeslas (nT)], and never exceeded 35 nT. The background magnetic intensity at this location was observed to be approximately 53,350 nT.

EM31 Electromagnetic Survey

The EM31 is a terrain conductivity meter which consists of a transmitter and receiver coils located at opposite ends of a rigid boom. The coil separation for the EM31 is approximately 13 feet, which yields an approximate depth of penetration of 18 feet in vertical dipole mode. Terrain conductivity measurements were collected at 0.5-second intervals along the lines of survey, and stored in a Polycorder data logger. Prior to the start of surveying, the EM31 was calibrated at the background location in the floodplain, 50 feet west of monitoring well MW103. The EM31 conductivity data was used to delineate the limits of conductive fill within the area of investigation.

GEOPHYSICAL DATA PROCESSING AND RESULTS

The EM61, magnetic, and EM31 data were also processed as colored contour plots, which were superimposed on aerial images of the Site. The results of the EM61 metal detection survey are presented on Figure 3, the total field and magnetic gradient results are presented on Figures 4 and 5, respectively, and the EM31 conductivity results are presented on Figure 6. The EM61 data are included on the compact disk provided in Attachment A.

On Figure 3, the highest intensity metallic responses recorded by the EM61 are contoured dark purple to red, while areas of background response are colored blue. All remaining intermediate responses correspond to the color scale presented on the figure. The observed background response for the area of investigation ranged from approximately 20 to 40 milliVolts (mV). Anomalous responses relative to this range of background readings are discussed below.

A similar color scale was used for the total field and gradient magnetometer survey results (Figures 4 and 5, respectively). The background response for the total field magnetic survey was approximately 53,350 nT, and corresponds to pale-blue colored areas. Anomalous results up to 65,000 nT are colored red, and suppressed dipole responses (49,000 nT) are colored violet. For the gradient magnetic results the background of 0 nT/m is also colored pale-blue, with red and violet defining the upper and lower extremes of the gradient response (from 2,500 nT/m to -1,500 nT/m). All remaining intermediate responses correspond to the color scale presented on the figures. The total field and gradient magnetometer data are provided on the compact disk in Attachment A.

For the EM31 terrain conductivity results (Figure 6), the background response of 20 to 25 milliSiemens per metre (mS/m) is also represented by pale blue. The highest intensity terrain conductivity responses up to 204 mS/m are colored red, while areas of low response are colored purple to blue. All remaining intermediate responses correspond to the color scale presented on the figure. The EM31 terrain conductivity data are provided on the CD found in Attachment A.

For ease of reference, discussion of the survey results has been divided into survey areas identified as either the central portion of the Site (Lots 5177 and immediately adjacent portions of adjoining parcels), Quarry Pond floodplain (northeastern corner of Lot 5178), or by business name and lot number.

CENTRAL PORTION OF SITE

The EM61 results for the main Site reveal that a majority of the survey area yielded anomalous responses. Numerous weak to strong intensity metal detection anomalies were delineated, in areas where foundry sand, fly ash, and reinforced concrete were observed on-surface. These materials contribute significantly to the elevated EM61 responses, and make it difficult to isolate and identify specific features and anomalies associated with buried metal objects of interest. Thus, the EM61 results for this portion of the Site appear to indicate limits of fill in the former landfill area. The response for the central portion of the Site ranged from 250 to 5,000 mV. Piles of reinforced concrete bound the western and southern perimeter of this central portion of the Site. Remnants of rebar and concrete were observed on the surface throughout this central area, in addition to suspected fly ash and foundry sand.

The western portion of the Site yielded moderate to high intensity anomalous responses in the range of 500 to 5,400 mV. The lowest intensity responses (30 to 60 mV) were observed south of the Large and Small Pond area (south of control points 65 and 66, and selected areas to the west). Further to the west, high intensity responses were recorded in areas where slag was located on ground surface (between control points 74 and 86). The area in the vicinity of the former Air Curtain Destructor (ACD) also yielded high intensity anomalous responses in the range of 10,000 mV, due to the presence of a reinforced concrete pad.

The results along the northern boundary of the Site indicated medium to high intensity anomalous responses ranging from of 2,500 to 10,000 mV. This anomalous response was attributed to the presence of foundry sand (between control points 39 and 40) observed during the course of the survey.

The response observed in the southeast portion of the Site (where the former Busy Bee operations were located) indicates that the suspected limits of fill closely approximate the limit of the PRP Group's Preliminary Direct Contact Risk Presumptive Remedy Area (RPRA). However, a few anomalous responses ranging from 1,000 to 10,000 mV were delineated outside the limit of the RPRA. Due to their relatively small size, these anomalies are likely associated with the burial of discrete metal objects.

The total field magnetic results (Figure 3) indicate that several discrete magnetic anomalies were delineated within the survey area. The highest magnetic intensity in the central portion of

the Site was observed in the northern portion of the survey coverage. Two very distinct anomalies, both elongated and generally trending in a southwest to northeast direction, were delineated in this area. The anomaly to the north (between control points 46 and 39) extends from the ACD concrete pad northward to the Valley Asphalt fence line. This anomaly may be associated with the former access road leading to the ACD facility.

The anomaly to the south extends from the ACD approximately 500 feet eastward. This anomaly may be attributed to former infrastructure associated with the ACD. The intensities of these two anomalies ranged from 57,000 to 65,000 nT. The magnetic gradient response (Figure 4) indicates that the two total field anomalies were also characterized by peak magnetic gradients on the order of 2,500 nT/m.

Elevated responses were also observed approximately 40 feet south of the previous anomaly (south of control points 48 and 49). These two discrete, oval-shaped anomalies are likely linked to the ACD due to their close proximity, and may represent ACD ash disposal areas. Peak total field and magnetic gradient intensities for these features ranged from 60,000 to 63,000 nT, and 1,800 to 2,200 nT/m, respectively.

Another large oval-shaped anomaly was detected in the southern portion of the main Site (north of control point 78). The area of anomalous response measured approximately 200feet long by 70 feet wide, and was characterized by a total field magnetic response of 55,000 to 56,000 nT. The associated magnetic gradient response was moderate and ranged from 500 to 600 nT/m).

One large, irregular-shaped anomaly (approximately 50ft by 50ft), and several smaller, discrete anomalies were detected within the northeast corner of the main Site (east of control point 51). The total field response for these anomalies ranged from 54,000 to 59,000 nT, and the magnetic gradient survey of these areas yielded measurements of 500 to 2,000 nT/m. These anomalies are likely associated with the disposal of numerous small metallic objects which were observed on and immediately below the ground surface, including automotive brake drums, brake pads, and other small car parts.

The EM31 conductivity survey results presented on Figure 6 reveal that a majority of the main Site was characterized by elevated conductivity responses in the range of 100 to 200 mS/m. The only exception is the location of the former Busy Bee operation, where background responses of 20 to 30 mS/m were predominant. The red-colored areas evident within the main Site suggest the presence of a continuous, high conductivity layer in the shallow (up to 18-foot depth) subsurface. Based on observations recorded in the field as the survey was being conducted, this composition of the shallow subsurface consists of fly-ash, foundry sand, slag, reinforced concrete, and disposal areas comprised of small, discrete metallic objects. Thus, the EM31 conductivity results also indicate suspected limits of fill in the former landfill area.

QUARRY POND FLOODPLAIN

The Quarry Pond floodplain is a low-lying area located on the northeastern corner of Lot 5178, east of the northern portion of the Quarry Pond, and directly south of the main Site (Lot 5177). The EM61 survey results for this area (Figure 3) indicate that the survey results were variable, and ranged from approximately 50 to 4,000 mV. The largest area of anomalous response was observed in the vicinity of control point 102, which yielded responses of 750 to 4,000 mV. Additional elevated readings were noted west of control point 110, where reinforced concrete was encountered. With the exception of smaller discrete features of weak to moderate intensity, the remainder of the floodplain was characterized by responses slightly above background (50 to 100 mV).

The total field magnetic results (Figure 4) reveal that the floodplain was generally characterized by slightly anomalous values ranging from 53,400 to 53,450 nT (compared to a background of 53,350 nT). The only exceptions noted were small areas of moderate response (54,750 to 55,500 nT), west of control point 102. Similarly, the magnetic gradient results for the floodplain were only slightly anomalous (25 to 50 nT/m), with the exception of small areas of moderate response (750 to 1,000 nT/m) at locations coincident with the total field anomalies.

The EM31 conductivity results (Figure 6) reveal that the floodplain yielded background conductivity values of 25 mS/m, with the exception of a small, moderately elevated response in the vicinity of control point 102. In this area, a moderately conductive anomaly with intensity 75 to 85 mS/m was detected.

JIM CITY AUTO SALVAGE - LOTS 3753 AND 4423

Prior to the commencement of the geophysical investigation at Jim City Auto Salvage (Jim City), the owner was contacted and agreed to clear vehicles from his property to accommodate completion of the surveys. The northern portion of the Jim City property was cleared in late September, and the southern portion of the property was cleared in late November. To the extent possible metal consolidation occurred in these areas prior to surveying, however numerous partially buried objects could not be removed and were left in place.

Several EM61 anomalies were delineated within the boundary of the Jim City property, as indicated on Figure 2. The smaller of these anomalies can be attributed to the discrete metal objects that were observed on the ground surface as the survey was being conducted. For some of the larger anomalies, which generally ranged in intensity from 500 to 5,000 mV, the sources could not be determined in the field.

The total field magnetic results for the Jim City property were generally characterized by responses slightly above background, ranging from 53,400 to 53,500 nT. Some exceptions were noted, however, and were comprised of small, moderately elevated anomalies. Most of these features were associated with surficial objects including a manhole cover north of control point 147, and partially buried tire rims north and east of control point 129. Similarly, the gradient magnetic results were only slightly above background (50 to 100 nT/m) with the exception of anomalies associated with the manhole cover and also the crusher located between control points 137 and 138.

Two areas of elevated terrain conductivity ranging from 75 to 200 mS/m were delineated on the Jim City property, as indicated on Figure 6. The first anomaly is an oval-shaped feature at control point 130, which measures approximately 200 feet in length and 150 feet in width. The second anomaly appears as an oval-shaped feature at control point 121, but increases in width northward to eventually cover the entire northern property boundary. The sources of these anomalous responses were not evident in the field as the surveys were being conducted.

DRYDEN ROAD PROPERTIES - LOTS 5171 TO 5176

The geophysical results for the Dryden Road properties reveal that survey coverage among the different surveys was not consistent in this portion of the area of investigation. Some surveys, particularly the total field and gradient magnetic surveys, experienced too much interference in close proximity to buildings and salvage vehicles/heavy equipment which could not be moved. Thus, these areas were not surveyed. In addition, some property owners were not always available to allow access to their properties, so these areas were also not surveyed.

The EM61 results for the Dryden Road properties confirm that various amounts of anomalous fill are likely present beneath these areas. Weak to moderate responses ranging from 300 to 1,200 mV were measured at Lots 5172, 5173, and 5174, which comprise the middle portion of the survey area along Dryden Road. In the Lots to the south (5175 and 5176), the responses generally were at background levels or slightly above (50 to 100 mV), with the exception of anomalies which usually could be attributed to surficial metal objects. In the northeast portion of the area of investigation (Lot 5171), the EM61 anomalous response varied from 250 to 2,000 mV. Numerous large metal objects and vehicles were located on this parcel, which accounts for some of the anomalies. However, the sources of many anomalies delineated in open areas of Lot 5171 could not be identified in the field and thus likely represent the response of buried metal objects and/or fill.

The total field and gradient magnetic survey could only be completed over the eastern portion of Lot 5171, due to sources of interference as discussed above. The total field magnetic survey results for this area indicate that small, discrete anomalies were located north of control point 23

and northeast of control point 16, with responses ranging from 54,000 to 58,000 nT. The corresponding magnetic gradient for these features ranged from 600 to 2,200 nT/m.

Results of the terrain conductivity completed in Lots 5172 and 5173 revealed that anomalous responses (up to 200 mS/m) indicative of conductive fill were detected along the western boundary of the surveyed area. Further to the east the response became moderate to weak, indicating little to no conductive fill in this area. To the north, two zones of moderately high conductivity responses were detected at either extent of Lot 5171. Both anomalous zones exhibited moderate intensities of 80 to 90 mS/m. In the middle of the surveyed area, the terrain conductivity response was characterized by background values of 20 to 30 mS/m.

VALLEY ASPHALT – LOT 5054 AND PART OF LOT 5177

EM61 and magnetic surveys were completed in the northern portion of the Valley Asphalt property including parking areas, the access road, and the grassed area north of the access road.

The EM61 anomalies north of the access road indicate that conductive fill is present beneath the grassed area. Responses ranging from 400 to 6,000 mV were measured there, and appeared to extend further to the west, beyond the survey coverage. Anomalies along the access road were also attributed to fill; however, these also likely include the responses of buried utilities. Further to the south, the parking area was generally characterized by responses slightly above background ranging from 40 to 120 mV. The moderate responses observed north of control point 9 were likely the result of metal beams which were located along the property fence in this area.

One small EM61 anomaly with an intensity of 600 mV was found in close proximity to the test trench (TT-21) that contained the buried drum (near control point 8). This feature was delineated in an area where a detailed grid consisting of 10-foot spaced survey lines was completed. A detailed 10-foot grid was used in this location due to the historic presence of buried drums at this location (site of the 2000 Valley Asphalt drum removal) and the discovery of a buried drum during the excavation of test trench TT-21 at this location in October 2008.

The total field magnetic results generally exhibited background to slightly elevated responses over the surveyed area, with few exceptions. Two small anomalies were detected with the magnetic gradient survey, in the vicinity of control point 4. The magnetic gradient intensity for these two features ranged from 400 to 2,000 nT/m. Another anomalous response was detected 160 feet east of control point 4, and likely was associated with the building immediately to the west.

DISCUSSION AND CONCLUSIONS

Based on the results of the Bathymetric/Geophysical Investigation, and the interpretations presented herein, CRA has arrived at the conclusions presented below.

Bathymetry Survey:

The Quarry Pond is divided by a shallow ridge trending approximately north-south. The Quarry Pond is deepest in the western portion (to the west of the ridge), where water depths generally between 20 to 30 feet and up to 35 feet were measured. The ridge is located to the south and north of the existing island, and relatively shallow water depths (approximately 5 to 15 feet) were present over the ridge. The water depth increased to between 15 and 23 feet east of the ridge, along a thin wedge adjacent to the shoreline.

Based on the results of the Bathymetry Survey, CRA recommends that the geophysical investigation of the Quarry Pond as outlined in the Letter Work Plan be eliminated from the scope of work. Based on the data obtained during the Test Pit/Test Trench Investigation and the Phase 1 Groundwater Investigation and a review of the historic aerial photos, it does not appear that the Quarry Pond was used for waste disposal. Some filling of the Quarry Pond did occur at the northeast corner of Lot 5178, i.e., the Quarry Pond floodplain. However, based on the stratigraphy observed in test trenches TT16 and TT16A, monitoring well MW-209A, piezometer P-211, and vertical aquifer sampling (VAS) location VAS-19, the fill placed in this portion of the Site appears to consist of silts and clays rather than waste. The geophysical work on the Quarry Pond floodplain would appear to confirm this given the relatively small number of anomalies, especially adjacent to the Quarry Pond itself. Further, the presence of numerous submerged trees and other vegetative debris would render the use of the submerged geophysical equipment necessitated by the depth of the Quarry Pond difficult if not impossible. A small number of drum carcasses are present in the shallow portions of the Quarry Pond. These drum carcasses appear to be the result of individual instances of dumping, i.e., they appear singly and are not associated with other wastes or waste filling. CRA proposes to remove any drums identified during the fall season when water levels in the Quarry Pond are at their lowest and any drums are at their most visible. The drums will be properly secured and characterized for off-Site disposal.

Geophysical Investigation:

The Geophysical Investigation revealed that numerous anomalies were detected with the various methods utilized within the area of investigation. A compilation figure outlining the anomalous responses from the various survey techniques is presented on Figure 7.

In general, the EM61 and EM31 conductivity results delineated limits of fill at the former landfill area. The EM61 survey also measured suspected fill responses at Lots 5172, 5173, and

5174, which comprise the middle portion of the survey area along Dryden Road. EM61 anomalies associated with scrap metal and partially buried car parts were detected at the Jim City property (Lots 3753 and 4423) at the southern end of the survey coverage.

In the central portion of the Site, the EM61 results indicated that a majority of the Site was characterized by anomalous fill, including suspected fly ash, slag, foundry sand, reinforced concrete, and buried metal objects. Background readings were measured south of the Large and Small Pond area to the southwest, and also in the southeast area of the former Busy Bee operations. The magnetic anomalies detected in the central portion of the Site are likely associated with the former access road, ACD infrastructure, and suspected buried metal waste. The central portion of the Site was also conductive, due to the conductive nature of the fill materials, which were discussed above. CRA reviewed existing test pit (TP), test trench (TT) and vertical aquifer sampling (VAS) stratigraphy to further assess these results.

CRA noted that TP-4, TP-5, TT-3, and VAS-11 were installed in and around the two large distinct anomalies, which are potentially associated with the former access road leading to the ACD. When CRA reviewed the stratigraphy logs for TP-4, TP-5, TT-3, and VAS-11, CRA concluded that metal debris, rebar, crushed steel drums, and tin cans were located in the upper five feet of fill and that foundry sand and slag were identified at depths ranging between 11 to 20 ft bgs. The identified material and associated depths are consistent with EM31, EM61, and magnetometer readings. The two large distinct anomalies identified as part of the field magnetics are consistent with the foundry sand and slag identified at depth in this area of the Site and are consistent in location and orientation with the former access roads shown in the 1954 and 1960 aerial photographs of the Site, which are provided in the USEPA document entitled "Aerial Photographic Analysis of South Dayton Dump Site, Moraine Ohio" (USEPA, June 2002).

Test pit TP-2 was installed within the limits of the total field magnetic anomaly present between the Small and Large Ponds. TP-2 contained metal shavings between approximately 2 and 7 ft bgs, which would account for the magnetic anomalies identified during the Geophysical Investigation.

No subsurface data exist at the location of the two total field magnetic anomalies along the eastern portion of Lot 5177. Based on the geophysical results and the review of TP, TT, and VAS stratigraphy observed in the central portion of the Site, CRA recommends that test pits be completed at two of the five coincident anomaly locations shown on Figure 7.

The results for the Quarry Pond floodplain (northeastern portion of Lot 5178) indicate that anomalous EM61 responses were detected in areas where reinforced concrete was observed at ground surface. The magnetic surveys generally yielded background or slightly elevated responses in the floodplain, with one exception. Coincident EM61 and magnetic anomalies were observed immediately west of control point 102. CRA reviewed available TP, TT, and

VAS stratigraphy data for this area to further assess these results. CRA noted that TT-14, TT-16, and TT-16A were installed in and around the anomaly. When the stratigraphy logs for TT-14, TT-16 and TT-16A were reviewed it was determined that metal rods and rebar were located in the upper five feet of fill. The identified material and associated depths are consistent with EM31 and EM61 readings for this anomaly. Based on these results, CRA recommends that no further investigative work be completed at this location.

The EM61 results for the Jim City property indicate that the majority of the responses can likely be attributed to metallic objects at or near ground surface. The lack of any significant magnetic anomalies in this area lends support to this conclusion. Two areas of conductive fill were identified at the Jim City property and the sources of these features were not identified at the time of surveying. The lack of magnetic or EM61 metal detection responses in the northernmost elevated conductivity anomaly likely indicates that the anomaly is the result of conductive fill rather than buried metal objects such as drums or tanks. CRA reviewed available TP, TT, and VAS stratigraphy data for the Jim City property to further interpret these results. CRA noted that TT-17 and VAS-22 were installed in and around these anomalies. The stratigraphic logs for TT-17 and VAS-22 show that rebar, scrap metal, and foundry sands were located in the upper five feet of fill. The identified material and associated depths of occurrence are consistent with EM31 and EM61 readings for these anomalies. Based on these results, CRA recommends that no further investigative work be completed at these locations.

The geophysical results for the properties along Dryden Road indicate that that various amounts of fill are likely present beneath these areas. The EM61 results indicate that the properties to the south (Lots 5174, 5175, and 5176) were generally characterized by background responses, weak to moderate responses are found at the centrally located properties (Lots 5172 and 5173), and the responses for the north property (Lot 5171) are variable. Coincident magnetic anomalies were detected for some of the EM61 features delineated at the north property. The conductivity results also suggest that conductive fill may be found beneath selected Dryden Road properties. CRA reviewed available TP, TT, and VAS stratigraphy data for this area to further interpret these results. CRA noted that TT-23 and VAS-14 were installed in and around several of the anomalies. The stratigraphic logs for TT-23 and VAS-14 show that scrap metal was located in the upper five feet of fill near TT-23. CRA did not observe conductive fill materials during the drilling of VAS-14. Based on the geophysical results observed at the Dryden Road properties, CRA recommends that test pits be completed at the two large anomaly locations shown on Figure 7.

The northern portion of the Valley Asphalt property (Lot 5054) was characterized by anomalous EM61 responses indicative of conductive fill. To the south, the parking lot was generally characterized by background EM61 and magnetic responses. One small EM61 anomaly with an intensity of 600 mV was found in close proximity to test pit TT21, where the buried drum was encountered (near control point 8). This feature was delineated in an area where a detailed grid consisting of 10-foot spaced survey lines was completed. Based on the results of the previous

test pitting program and the drum encountered in test pit TT21, CRA recommends that a test pit be completed at the EM61 anomaly located approximately 20 to 25 feet southwest of control point 8, as shown on Figure 7.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

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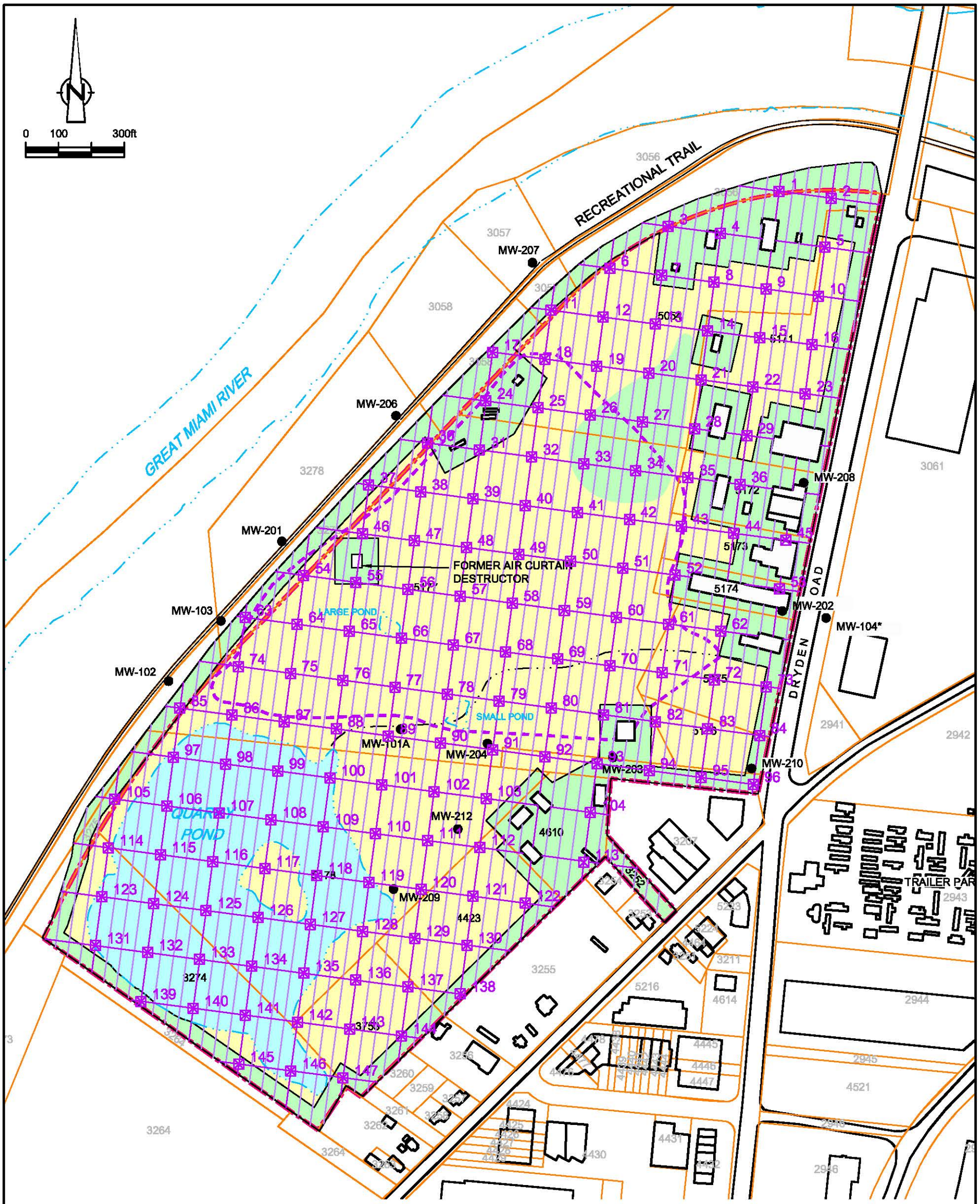
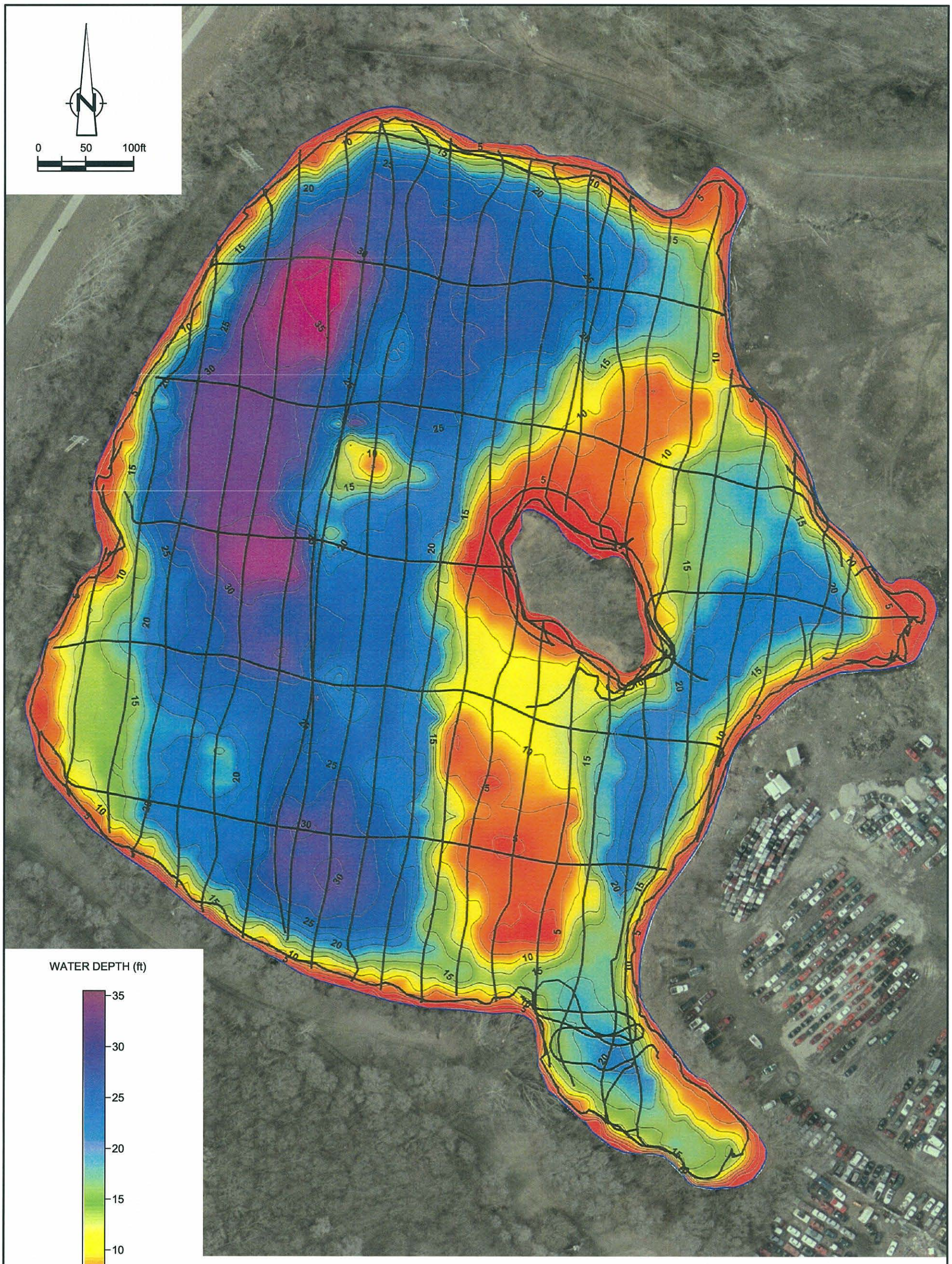


figure 1

PROPOSED GEOPHYSICAL SURVEY GRID COVERAGE SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

38443-30(CIBU057)GN-WA001 MAR 27/2009



NOTE: WATER DEPTHS ARE RELATIVE TO A WATER LEVEL DATUM OF 711.37 ft. AMSL MEASURED ON MAY 21 AND MAY 22, 2008.

figure 2

BATHYMETRY SURVEY RESULTS - QUARRY POND
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-30(CIBU057)GN-WA006 MAR 27/2009

0 100 300ft

GREAT MIAMI RIVER

RECREATIONAL TR

SUSPECTED ASPHALT STOCKPILE

QUARRY POND

HYDE RD

29610-3

METAL DETECTION RESPONSE (mV)

10,000
5,000
2,500
1,500
1,250
1,000
750
500
250
0

EM61 CONDUCTIVITY ANOMALY

PRELIMINARY DIRECT CONTACT RISK PRESUMPTIVE REMEDY AREA

figure 3

EM61 METAL DETECTION SURVEY RESULTS SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

38443-30(CIBU057)GN-WA002 MAY 22/2009

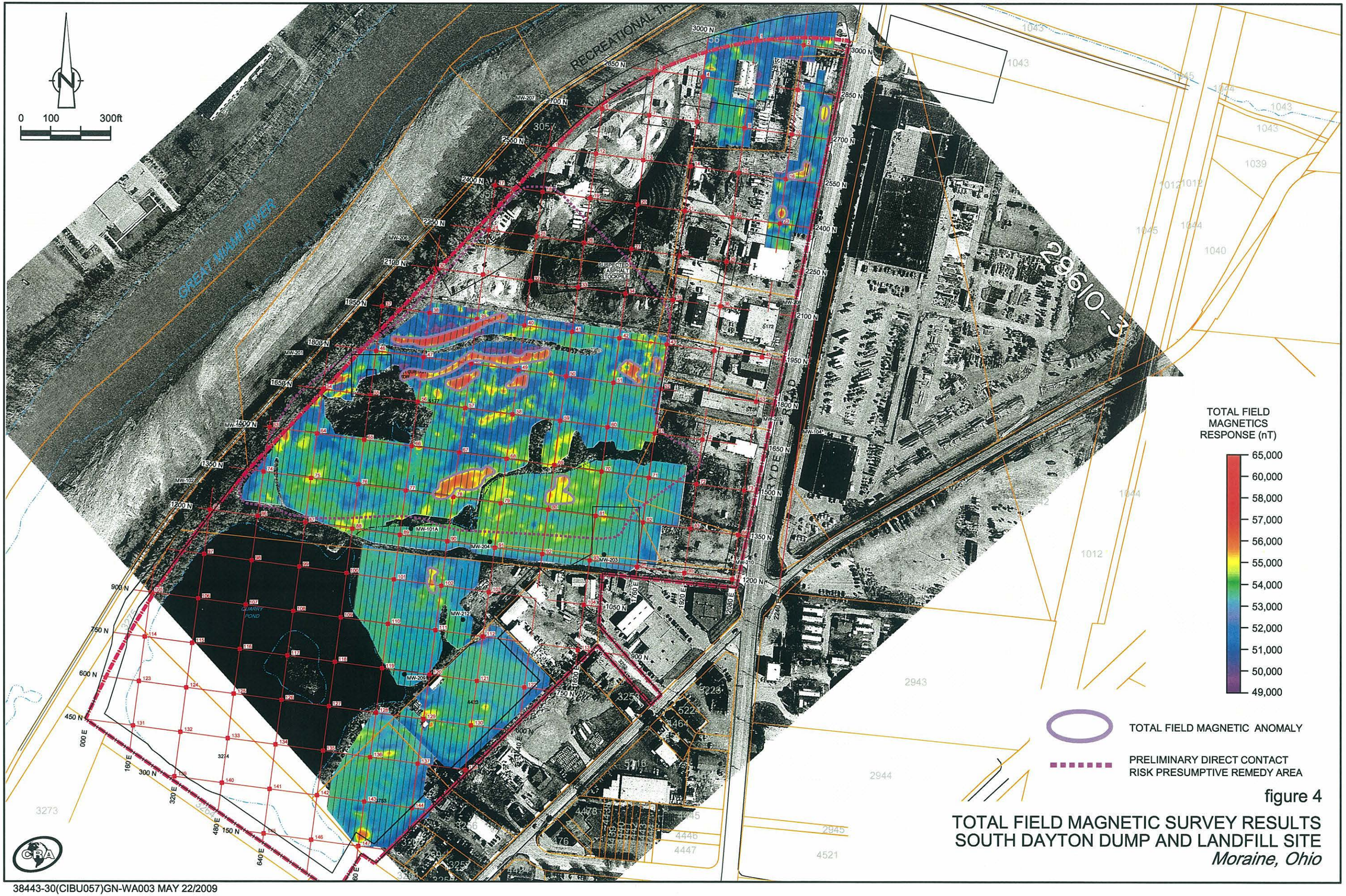


figure 4

TOTAL FIELD MAGNETIC SURVEY RESULTS SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

38443-30(CIBU057)GN-WA003 MAY 22/2009

0 100 300ft

GREAT MIAMI RIVER

RECREATIONAL TR

SUSPECTED ASPHALT STOCKPILE

QUARRY POND

MW-207 MW-206 MW-205 MW-201 MW-202 MW-102 MW-101A MW-204 MW-203 MW-212 MW-208 MW-104 MW-210

MAGNETIC GRADIENT RESPONSE (nT/m)

2500
2000
1500
1000
500
0
-500
-1000
-1500

PRELIMINARY DIRECT CONTACT RISK PRESUMPTIVE REMEDY AREA

figure 5

MAGNETIC GRADIENT SURVEY RESULTS SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

38443-30(CIBU057)GN-WA004 MAR 27/2009

0 100 300ft

GREAT MIAMI RIVER

RECREATIONAL TR

SUSPECTED ASPHALT STOCKPILE

QUARRY POND

29610-3

EM31 CONDUCTIVITY RESPONSE (mS/m)

200
150
100
75
50
25
0

EM31 CONDUCTIVITY ANOMALY

PRELIMINARY DIRECT CONTACT RISK PRESUMPTIVE REMEDY AREA

figure 6

EM31 CONDUCTIVITY SURVEY RESULTS SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

38443-30(CIBU057)GN-WA005 MAY 22/2009

0 200 400ft

FORMER LOCATION OF DAYTON RECYCLING USTs

APPROXIMATE LOCATION OF DRUM REMOVAL IN 2000

RECREATIONAL TRAIL

GREAT MIAMI RIVER

QUARRY POND

LARGE POND

SMALL POND

DRYDEN ROAD

ASPHALT PILE

APPROXIMATE LOCATION OF FORMER CUSTOM DELIVERY UST AREA

FORMER AIR CURTAIN DESTRUCTOR

TRAILER PARK

MW-207 MW-206 MW-201 MW-103 MW-102 MW-101A MW-204 MW-205 MW-202 MW-104* MW-208 MW-210 MW-211 MW-209

TT1 TT1A TT2 TT3 TT4 TT5 TT6 TT7 TT8 TT9 TT10 TT11 TT12 TT13 TT14 TT15 TT16 TT16A TT17 TT18 TT19 TT20 TT21 TT22 TT23

TP1 TP2 TP3 TP4 TP5 TP6 TP TP TP TP TP

VAS-01 VAS-02 VAS-03 VAS-04 VAS-05 VAS-06 VAS-07 VAS-08 VAS-09 VAS-11 VAS-12 VAS-13 VAS-14 VAS-15 VAS-17 VAS-19 VAS-20 VAS-21 VAS-22 VAS-23 VAS-24 VAS-25

LEGEND

- MW-206 ● UPPER AQUIFER MONITORING WELL LOCATION
- * APPROXIMATE LOCATION
- SITE BOUNDARY (SOW 2006)
- PRELIMINARY DIRECT CONTACT RISK PRESUMPTIVE REMEDY AREA
- EDGE OF WATER
- TP PROPOSED TEST PIT LOCATION
- TOTAL FIELD MAGNETIC ANOMALY
- EM31 CONDUCTIVITY ANOMALY
- EM61 METAL DETECTION ANOMALY
- TT1 ACTUAL TEST TRENCH LOCATION
- ▲ VAS01 ACTUAL VAS SAMPLING LOCATION
- □ TP3 ACTUAL TEST PIT LOCATION

figure 7

COMPILATION OF GEOPHYSICAL ANOMALIES AND PROPOSED TEST PIT LOCATIONS SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
USGS AERIAL PHOTOGRAPH, DAYTON SOUTH, 1994.

38443-30(CIBU057)GN-WA007 MAY 27/2009

ATTACHMENT A

BATHYMETRY SURVEY AND GEOPHYSICAL INVESTIGATION DATA